Regular Review

Guidelines for management of patients with psoriasis

Workshop of the Research Unit of the Royal College of Physicians of London; Department of Dermatology, University of Glasgow; British Association of Dermatologists

Psoriasis affects 1-2% of the population of the United Kingdom.[1] The degree of psychological and social morbidity that accompanies psoriasis is commonly underestimated by the medical profession[2] and this can result in less than optimal care. After an initiative by the research unit of the Royal College of Physicians of London and the dermatology department of the University of Glasgow, which was subsequently endorsed by the British Association of Dermatologists, a group of dermatologists met to produce guidelines for managing patients with psoriasis. These guidelines are aimed at everyone who is concerned in the management of patients with psoriasis, and their purpose is to promote a high standard of continuing care.

Clinical features

The diagnosis of psoriasis is clinical and most doctors should have few problems in diagnosing most cases. Laboratory investigations are rarely helpful.

There are several clinical forms of psoriasis, and a person may, during a lifetime, move from one type to another. The body surface area affected can range from a small area to almost total coverage. Psoriasis can change qualitatively from stable plaque lesions to an unstable form typified by eruptive inflammatory lesions that are easily irritated by topical treatment. Drugs thought to precipitate or worsen psoriasis include alcohol and, in some patients, β blockers and non-steroidal anti-inflammatory agents. Lithium, chloroquine, and mepacrine may be associated with severe, even life threatening, deterioration of psoriasis.

The assessment of severity should include two different components: firstly, the patient's own perception of disability—that is, the "need for treatment"—and, secondly, an objective assessment of the extent and severity of body involvement.

For family doctors most information will be obtained from the patient's need for treatment. Many dermatologists use measures such as body mapping or the psoriasis area and severity index to give a rough guide of objective improvement with treatment. Measurements of percentage area affected alone, however, are not sufficient as similar extents of coverage at different sites, such as the trunk and hands, create different degrees of disability and distress. Furthermore, the degree of disability experienced by different people with the same amount of psoriasis varies greatly. Because of this the aim of management should always be determined in close association with the individual patient's views. It is good practice to record in the clinical notes what patients think is the most upsetting aspect of their psoriasis. Management aims can then be directed appropriately within therapeutic limitations and judgments based on the risk:benefit ratio.

Recommendations for initial management

No cure yet exists for psoriasis, and therefore treatment is suppressive, aimed at inducing a remission or making the amount of psoriasis tolerable for the patient. Relapses are difficult to predict and cannot be prevented with topical therapeutic agents. Most patients with stable chronic plaque psoriasis and guttate psoriasis should be cared for by general practitioners. Patients with severe psoriasis who require systemic agents, however, should normally be under the continuing supervision of a consultant dermatologist because of the potential toxicity of these drugs. The box lists indications for referral to a consultant dermatologist.

Indications for referral to a consultant dermatologist

- Diagnostic difficulty
- Request for patient counselling or education, or both, including initial demonstration of topical treatment
- Failure of topical treatment used appropriately for three months
- Need for increasing amounts or potencies of topical corticosteroids
- Need for systemic drugs
- Generalised pustular or erythrodermic psoriasis (emergency referral)

Basic information about psoriasis and its management should be available to patients at their initial presentation (see box listing points to discuss). Patient information sheets are recommended as reinforcements to verbal information, and a practical demonstration of treatment techniques can be extremely valuable.

Points to discuss at initial presentation

- Explanation of psoriasis, including reassurance that it is neither infectious nor malignant
- Treatment options (including no active treatment)
- What the patient can expect or hope for from treatment
- Techniques of application of any topical treatment (especially important for dithranol)

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Types of psoriasis

CHRONIC PLAQUE PSORIASIS

Figure 1 illustrates chronic plaque psoriasis. Depending on the patient's wishes, appropriate management includes the option of no active treatment or the use of a simple emollient. If active treatment is required then the vast majority of patients can be adequately managed with topical agents of proved efficacy such as tar[3] and dithranol.[4] Under carefully monitored conditions, which are fully recorded below, the use of topical corticosteroid preparations is also appropriate.

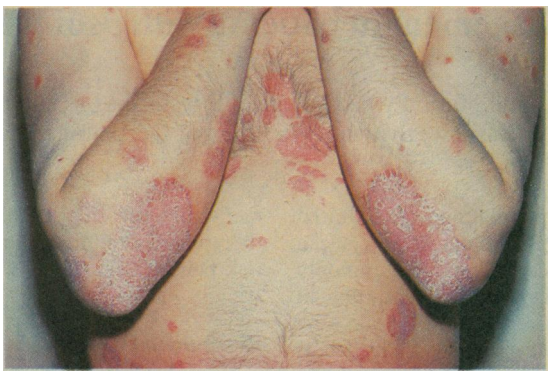

FIG 1—*Chronic plaque psoriasis*

Although each patient must be individually assessed, in general the larger the individual psoriatic plaques and the fewer their number the more appropriate is dithranol. The more numerous the lesions and the smaller they are, the more difficult the use of dithranol becomes, and tar and topical corticosteroids become more suitable. The effect of all topical treatments can be enhanced by suitably supervised treatment with ultraviolet B radiation.

Care must be exercised when a patient's psoriasis is in an inflammatory, eruptive, or unstable phase. In these circumstances the skin may display a general, non-specific irritancy to topical treatments, and therefore only emollients or low concentrations of tar or dithranol should be used.

Topical coal tar—Coal tar is extremely safe and can be used either as a refined product, of which there are many commercially available examples, or as cruder extracts such as crude coal tar in petroleum jelly. The cruder tar extracts are messier to use but are generally considered to be much more effective than more refined products such as coal tar solution. Although there is little published evidence to support the use of any particular concentration, a common treatment regimen is to start with concentrations of 0·5-1·0% of crude coal tar in petroleum jelly and increase the concentration every few days to a maximum of 10%.

Topical dithranol (anthralin)—Use of dithranol must be accompanied by adequate explanation of side effects, such as irritancy and staining of the skin and clothes. To minimise side effects treatment should normally be started at a concentration between 0·1% and 0·25% and increased in doubling concentrations as the response of psoriasis and development of drug induced irritancy allows. Great care should be taken with dithranol on sensitive body sites such as the face, flexures, and genitalia. It is reasonable to start treatment with a commercially available preparation, but for resistant lesions there may be an advantage in prescribing a similar concentration of dithranol in a different preparation such as modified Lassar's paste. The use of dithranol in the so called "short contact mode," in which the preparation is left on the skin for only 15 to 45 minutes every 24 hours, can be of great social advantage to the patient without a significant reduction in efficacy.[5]

Topical corticosteroids—Although effective, cosmetically acceptable, and safe under proper supervision, the use of topical corticosteroids in psoriasis is accompanied by a risk of side effects such as dermal atrophy, tachyphylaxis, fast relapse times, precipitation of unstable and pustular psoriasis,[6] and, in extreme cases, adrenal suppression due to systemic absorption. These risks are related to the potency and cumulative amount of steroid used and the concomitant use of occlusion. If appropriate guidelines are followed (box), however, the use of British National Formulary grade IV (mild) preparation on the face and a grade IV or grade III (moderately potent) preparation elsewhere remains a useful and acceptable therapeutic option.

Guidelines for the use of topical corticosteroids

- There should be regular clinical review
- No unsupervised repeat prescriptions should be made
- No more than 100 g of a British National Formulary grade III (moderately potent) preparation should be applied each month
- There should be periods each year when alternative treatment is employed
- Use of British National Formulary grade I (very potent) or grade II (potent) preparations should be under dermatological supervision

Response to topical treatment—For as yet poorly understood reasons some patients who fail to respond to one topical agent will respond to another. It is therefore worth trying alternative topical agents before considering more aggressive management. Similarly, a patient who does not respond to a particular topical

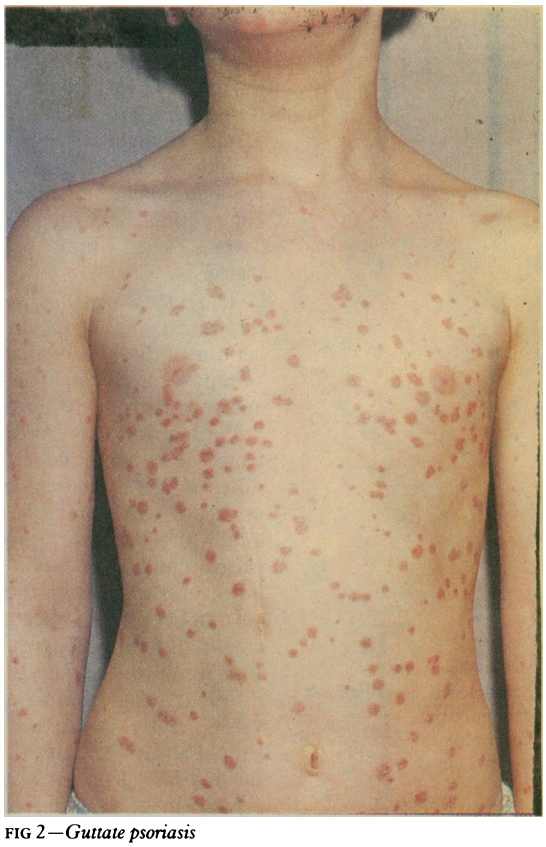

FIG 2—*Guttate psoriasis*

agent on one occasion may respond well to the same agent at some time in the future.

GUTTATE PSORIASIS

In most cases guttate psoriasis (fig 2) is a self limiting condition. Furthermore, many patients who have one attack of guttate psoriasis have no further attacks of any type of psoriasis. The general principles for treatment outlined above for chronic plaque psoriasis are also applicable to guttate psoriasis. Erupting guttate psoriasis, however, is commonly less tolerant of topical treatment, and therefore low concentrations of tar and dithranol should be used. Ultraviolet B radiation may be especially helpful. A proportion of patients with acute guttate psoriasis have evidence of streptococcal infection. Therefore, an appropriate physical examination and investigations should be carried out and any evidence of persistent streptococcal infection treated with phenoxymethyl penicillin or erythromycin. Repeated attacks of guttate psoriasis after well documented episodes of tonsillitis is an indication for referral to an otolaryngologist for consideration of tonsillectomy.

LOCALISED PUSTULAR PSORIASIS OF PALMS AND SOLES

Pustular psoriasis of the palms and soles is a relatively rare form of chronic psoriasis typified by multiple sterile pustules (fig 3). Treatment is unsatisfactory, but a moderately potent topical corticosteroid (British National Formulary grade III) may relieve symptoms. Topical coal tar and dithranol may also be of some benefit, and some success has been achieved with the systemic agent etretinate.

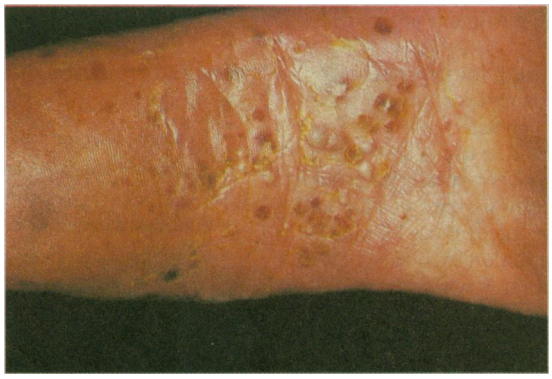

FIG 3—*Localised pustular psoriasis on sole of foot*

GENERALISED PUSTULAR PSORIASIS AND ERYTHRODERMIC PSORIASIS

Figure 4 illustrates generalised pustular psoriasis and figure 5 erythrodermic psoriasis. For the small group of patients with these forms of psoriasis initial management usually consists of admission to hospital and the use of systemic agents.

Phototherapy with ultraviolet B

Ultraviolet radiation in the wavelength band 290 nm to 320 nm (ultraviolet B) is a useful treatment for chronic plaque psoriasis and guttate psoriasis. It may be used in conjunction with coal tar[7] or dithranol[8] or used on its own. The main side effects of ultraviolet B radiation are short term erythema and, when used over a prolonged period, a possible increase in the risk of developing cutaneous malignancy. Although it has been used for many years, exact dosage regimens and strict entrance and exit criteria are not available, but it is likely that suboptimal treatment has been common. Patients with a concomitant disease exacerbated by sunlight, such as lupus erythematosus, should not be treated with ultraviolet B.

Some emollients, such as white soft paraffin, absorb

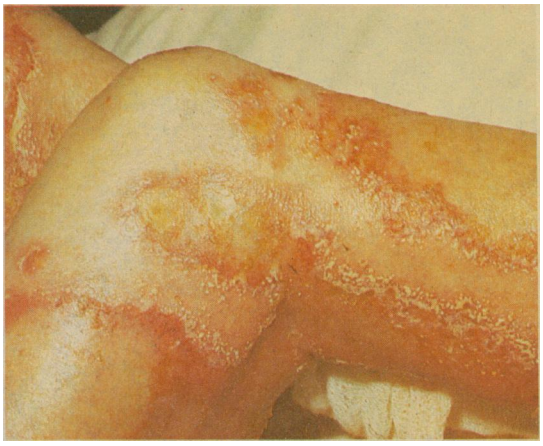

FIG 4—*Generalised pustular psoriasis*

energy of the ultraviolet B wavelength, so reducing the efficacy of phototherapy. A suitable non-screening pretreatment emollient is coconut oil. For maximum efficacy the starting dose of ultraviolet B should be judged after estimating the minimal erythema dose. A suggested regimen is to start with about 70% of the mineral erythema dose. Successive doses are increased by 40% of the immediately preceding dose if there is no erythema, increased by 20% if there is slight erythema, but held at the same exposure if there is more than slight erythema. With this intensive regimen treatments should be given no more frequently than every 48 hours, and it is common for a course of ultraviolet B radiation to be of no longer than eight to 10 weeks' duration. The box records recommendations for phototherapy and photochemotherapy.

Recommendations for phototherapy and photochemotherapy

- A senior clinician, usually a consultant, with adequate training and a continuing interest in phototherapy or photochemotherapy should supervise the service
- An individual patient's course of treatment should be supervised by an adequately trained person (doctor, nurse, physiotherapist, etc)
- All phototherapy equipment should be adequately maintained and regularly calibrated by adequately trained personnel
- Accurate records of dosage and number of treatments for each patient must be maintained
- Neither ultraviolet B or psoralens plus ultraviolet A (PUVA) should be used as continuous maintenance treatment unless alternative topical treatments have proved ineffective

Sunbeds—The use of commercially available sunbeds (which emit ultraviolet A) is rarely effective in psoriasis and may be associated with significant side effects such as premature skin aging and increased skin fragility. Their use is not recommended.

Systemic treatment including photochemotherapy

The decision to move from topical to systemic treatment (box) should be made by a senior dermatologist experienced in managing psoriasis. It is a complex decision based not only on objective disease severity but also on social and psychological factors.

Before instigating systemic treatment the clinician must be satisfied that the patient understands and is capable of cooperating with the necessary restrictions associated with the use of each of the systemic agents.

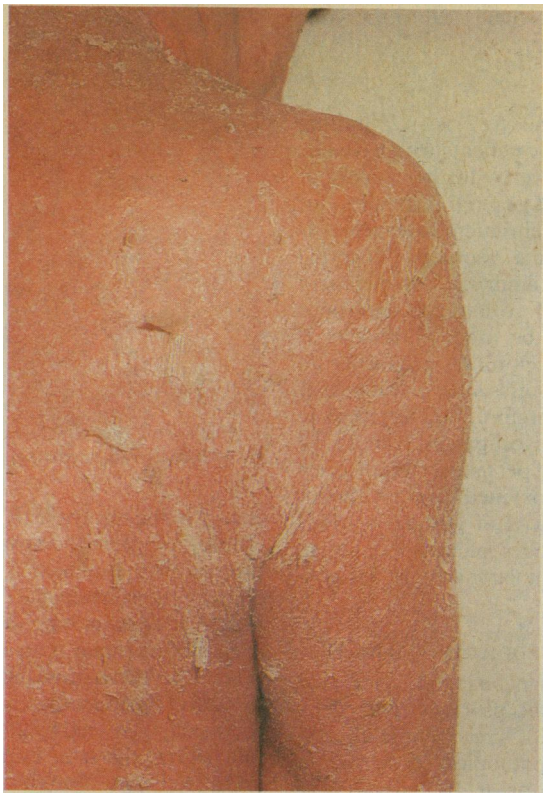

FIG 5—*Erythrodermic psoriasis*

Patients may benefit from carrying a systemic treatment card to help prevent the prescription of drugs which might interact with the particular antipsoriatic agent they are receiving.

Systemic treatments used are photochemotherapy, methotrexate, retinoids, hydroxyurea, cyclosporin, azathioprine, and, in a few specific but very rare circumstances, corticosteroids. The use of all systemic agents can be accompanied by potentially fatal side effects, and as they have different toxicity profiles and contraindications the choice of agent must be tailored for each patient. The information on each agent given below should be read in conjunction with the table.

All of the commonly used systemic agents are absolutely contraindicated in pregnancy. Before giving any of these agents to women of childbearing age the risks should be explained to the patient and the absolute necessity for contraception explained.

Very rarely patients with severe psoriasis require combination treatment with two or more systemic agents. Because the toxicity from any two systemic agents is at least additive extreme caution should be exercised before instigating such treatment. If combination treatment is undertaken special attention should be paid to the careful monitoring of these patients.

PHOTOCHEMOTHERAPY

Administration of oral or topical psoralens followed by irradiation with long wave ultraviolet radiation in the 320-400 nm range (ultraviolet A) is a proved and effective mode of treatment (psoralens plus ultraviolet A=PUVA).[9] It is probably the least toxic of all the systemic agents and is generally considered to be the systemic treatment of first choice. Many questions, however, remain as to the optimum regimen of ultraviolet A radiation and the type and formulation of psoralens.

Wherever possible the starting dose of ultraviolet A should be determined after estimation of the minimum phototoxic dose read at 72 hours. Although the optimum ultraviolet A regimen is not universally agreed on, a suitable starting dose would be 70% of the minimum phototoxic dose with successive doses increased by 40% of the immediately preceding dose if there is no erythema and other incremental adjust-

Indications for systemic treatment

- Failure of adequate trial of topical treatment
- Repeated hospital admissions for topical treatment
- Extensive chronic plaque psoriasis in elderly or infirm people
- Generalised pustular or erythrodermic psoriasis
- Severe psoriatic arthropathy

Systemic agents used in treatment of psoriasis

Systemic agent	Pretreatment assessment	Contraindications	Approximate response time	Precautions and monitoring
PUVA (psoralens+ ultraviolet A)	History and examination, liver function tests+eye examination	Pregnancy or wish to conceive, clinically significant cataracts, age <18 years, previous cutaneous malignancy, previously received ionising radiation or arsenicals, concomitant methotrexate or cyclosporin. Hypersensitivity to psoralens, psoriasis on shielded sites—for example, scalp—previously received PUVA with cumulative lifetime dose of >1000 J/cm² ultraviolet A	Four weeks	Contraception, ultraviolet A eye protection, shielding of genitalia unless specific need to treat,[10 11] regular skin examination for premalignant and malignant changes
Methotrexate	History and examination, full blood count, liver function tests, serum urea and electrolytes, serum creatinine, creatinine clearance	Pregnancy, breast feeding, wish to conceive, wish to father children, significant hepatic damage, anaemia, leucopenia, thrombocytopenia, excessive alcohol consumption, acute infectious diseases, diabetes or extreme obesity, immunodeficiency, interactive drugs, renal impairment (reduce dose)	Two weeks	Contraception (men and women), avoid drugs which interact (for example, non-steroidal anti-inflammatory drugs and co-trimoxazole), full blood count, liver function tests, serum urea and electrolytes, serum creatinine, consider liver biopsy
Etretinate	History and examination, full blood count, liver function tests, fasting serum lipids, spine radiography, pregnancy test	Pregnancy or wish to conceive within two years of stopping treatment, severe hypercholesterolaemia or hypertriglyceridaemia, severe hepatic or renal impairment, concomitant methotrexate	Six weeks	Contraception, liver function tests and fasting serum lipids (one month after starting treatment and then every three to six months), annual lateral radiography of thoracic spine
Cyclosporin	History and examination, blood pressure, serum creatinine, measurement of glomerular filtration rate, serum urea and electrolytes, magnesium and uric acid	Abnormal renal function, uncontrolled hypertension (diastolic blood pressure >95 mm Hg), previous or concomitant malignancy, concomitant radiation therapy, pregnancy and breast feeding, immunodeficiency and immunosuppression, interactive drugs, drug or alcohol misuse	Three weeks	Contraception, blood pressure (reduce dose if diastolic >95 mm Hg), serum creatinine (reduce dose if value increases >30% of patient's own baseline value)
Hydroxyurea	History and examination, full blood count, serum urea and electrolytes, serum creatinine	Pregnancy and breast feeding, severe anaemia or leucopenia or thrombocytopenia, hypersensitivity to hydroxyurea	Four weeks	Contraception, full blood count, liver function tests (weekly during first month and then monthly)
Azathioprine	History and examination, full blood count, serum urea and electrolytes, serum creatinine, liver function tests	Pregnancy and breast feeding, severe anaemia, significant hepatic damage, interactive drugs	Four weeks	Contraception, full blood count, liver function tests (weekly during first two months and then with decreasing frequency), avoid drugs which interact
Systemic steroids	Used only in extreme and very rare circumstances			

*Estimate of how long any particular treatment should be tried before deciding it is ineffective.
†Measurement of aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, γ-glutamyl transpeptidase, bilirubin, and albumin.

ments (increases or decreases) depending on the individual patient's response. Such a regimen based on percentage increments rather than fixed increments will probably result in a shorter time to clearance, fewer treatments, and a lower total cumulative dose of ultraviolet A. Such an approach may reduce the likelihood of chronic cutaneous damage and the subsequent development of cutaneous malignancies, but further studies are needed to clarify the validity of this approach. If the more rapidly increasing regimens for PUVA are used treatment should not be given more than twice weekly.

To achieve consistent and optimum absorption of psoralens throughout a course of PUVA the drug should be taken with a light meal. A theoretical risk of cataract formation exists; patients should therefore have their eyes examined for cataracts before starting to receive PUVA and thereafter wear appropriate ultraviolet A screening sunglasses for 24 hours from the time of ingestion of psoralens.[12]

Because the risk of developing cutaneous malignancy is related to high cumulative doses of ultraviolet A, PUVA sparing measures or alternative treatments should be used, if possible, to restrict the cumulative lifetime dose of ultraviolet A to below 1000 J/cm^2. (In the future this value may more appropriately be expressed in cumulative lifetime number of treatments rather than cumulative dose.) Similarly, any patient who develops clinical signs of PUVA induced damage should be reassessed and the possibility of alternative treatment considered. Long term follow up of all patients who have received PUVA, even after their treatment is stopped, is also important. For a small group of patients, however, maintenance with PUVA is the only effective method of management of their disease, bearing in mind that alternative systemic treatments also carry significant risks of side effects.

METHOTREXATE

Methotrexate is an effective antipsoriatic agent.[13] It is especially useful in acute generalised pustular psoriasis, psoriatic erythroderma, psoriatic arthritis, and for extensive chronic plaque psoriasis in elderly or infirm patients. It can be used either as a short term option to gain control of unstable psoriasis such as pustular psoriasis or erythroderma before returning to other modes of treatment or, more often, as a long term maintenance treatment. The main side effects are acute marrow suppression and a long term risk of hepatic fibrosis and cirrhosis which is related to cumulative life time dosage[14] and regimen employed.[15]

Conception must be avoided during treatment with methotrexate and for at least one menstrual cycle after stopping the drug in women. Although normal children have been born with fathers who were taking methotrexate at the time of conception, methotrexate causes spermal abnormalities and is therefore contraindicated for men wishing to father children while taking the drug and for three months afterwards.

Dosage regimens—The dose of methotrexate must be individually assessed for each patient. Most serious problems and the rare deaths associated with the use of the drug for psoriasis arise because of an absolute or relative overdosage. It should be given as a single weekly oral, intravenous, or intramuscular dose. It should not be given as a regular daily dose as this results in an increased incidence of toxicity.[15] Because of the unpredictable response of patients, particularly elderly patients, to methotrexate many clinicians use an initial dose of 2·5 mg total dose irrespective of body weight. In no circumstances should the first dose exceed 0·2 mg/kg body weight. If subsequent laboratory studies give normal results regular maintenance methotrexate may be started one week after the initial dose. Doses are usually increased gradually from the first dose according to clinical response and any accompanying toxicity. The absolute maximum dose each week is 0·5 mg/kg body weight total dose, but many patients can be maintained with 10 mg a week or less total dose.

Drug interaction—The following drugs may interact with methotrexate and increase its activity: alcohol, salicylates, non-steroidal anti-inflammatory drugs, co-trimoxazole, trimethoprim, probenecid, phenytoin, retinoids, pyrimethamine,[14] and frusemide.[16] Patients receiving methotrexate and their family doctors must be given written instructions indicating the potential dangers of the concomitant administration of these drugs.

Monitoring treatment—On starting treatment with methotrexate a full blood count; measurement of serum urea, electrolyte, and creatinine concentrations; liver function tests; and clinical examination of the liver should be performed weekly. The interval between estimations may then be extended depending on clinical need. Typically, in a stable patient, the investigations should be repeated about every one to two months. A temporary and clinically unimportant rise in the activity of liver enzymes commonly occurs during the first few days after a dose of methotrexate.

Liver biopsy—In patients with persistently deranged liver biochemistry or abnormal results on liver imaging liver biopsy should be considered before starting or continuing methotrexate. In a small proportion of patients abnormal liver pathology has occurred in the absence of any biochemical or imaging abnormality.[17] It would therefore seem that the only certain way to exclude methotrexate induced liver damage is to perform regular liver biopsies. But liver biopsy itself has significant associated morbidity and, indeed, mortality, and the only reported cases of severe hepatic fibrosis due to methotrexate have occurred in patients receiving different regimens with much larger doses than those in general use today.[18] No firm guidelines, therefore, can be suggested concerning the use of liver biopsies in patients receiving methotrexate with normal liver biochemistry and images. Many practitioners, however, perform a liver biopsy on patients before or shortly after starting treatment with methotrexate and then after every 1·5 g cumulative lifetime dose. Exceptions are made for people over 70 years and when only short term treatment with methotrexate is envisaged.

RETINOIDS

Retinoids, which are synthetic analogues of vitamin A, can be very effective in patients with psoriasis, especially those with acral or generalised pustular forms.[19] The only retinoid marketed in the United Kingdom for treating psoriasis is etretinate (Tigason), and this is available only on consultant prescriptions through hospital pharmacies. Although it is useful in individual patients the general experience with etretinate in treating chronic plaque psoriasis has been disappointing. Despite producing improvement in scaling and plaque thickness etretinate produces remission in fewer patients than other systemic treatments such as methotrexate or PUVA. The main side effects associated with retinoids are potent teratogenicity, increases in serum lipid concentrations, and mucocutaneous inflammation. Dry, fissured lips are almost universal, and many people experience nasal soreness, drying of the hair, and even some hair loss. After prolonged treatment skeletal changes have also been reported.

Precautions in women—Because etretinate is stored in the body its teratogenic potential persists for about two years after stopping treatment. Very careful consideration should therefore be given to the appropriateness of initiating treatment with etretinate in

women wishing to have future pregnancies. The high risk of fetal malformation if pregnancy occurs during treatment or in the two years after its completion should be emphasised to women offered the treatment, as should be the absolute need for adequate contraceptive measures for at least one month before treatment, during treatment, and for at least two years after stopping treatment. There should be no exceptions to this policy.

Dosage regimens—The dosage of etretinate should be individually tailored according to the patient's clinical response and the severity of side effects. A common starting dose is 0·75 mg/kg body weight a day in divided doses. This should be continued for between two and four weeks. After this period the patient should be reassessed clinically. If the clinical response is adequate the dose could, for example, be reduced to 0·5 mg/kg body weight a day and subsequently titrated down to the lowest effective dose possible.

CYCLOSPORIN

Cyclosporin is very effective for severe psoriasis, and providing that guidelines for treatment[20] are observed it also seems safe when used over periods of up to a year. However, as the long term safety of cyclosporin in patients with psoriasis is still to be established it is not the drug of choice for the patient likely to require continuous treatment for many years. The main side effects are hypertension and renal impairment, both of which are reversible if guidelines for treatment are followed. In other clinical conditions, such as immunosuppression after transplantation, the incidence of lymphoma is increased in people receiving cyclosporin long term.

Dosage regimens—The dose of cyclosporin must be individually tailored to each patient. The initial dose is commonly 3-4 mg/kg body weight a day given as a single daily dose or divided into two. If improvement does not occur in two weeks the dose can be increased but should not exceed 5 mg/kg body weight a day orally. If considerable improvement has occurred the dose should be reduced in steps of 0·5-1·0 mg/kg body weight a day to achieve the lowest possible dose for maintenance.

Monitoring—Clinical assessment of blood pressure, urinalysis, measurement of serum creatinine and urea concentrations, and liver function tests should be performed every two weeks during the initial three months of treatment and then monthly if the patient is stable. Controversy exists as to the need for more sophisticated monitoring of renal function beyond the estimation of serum creatinine concentration. Ideally, renal function should be assessed before starting cyclosporin treatment by measuring the glomerular filtration rate by inulin, isotope, or iothalamate clearance or renal blood flow. Creatinine clearance is a less accurate but more readily available method for determining glomerular filtration rate. The method used to measure the baseline rate should be repeated after about two months after the start of treatment with cyclosporin. Any change in the rate should be correlated with the change in serum creatinine concentration to determine whether serum creatinine concentration can be used as a reliable method of assessing glomerular filtration rate in the patient. If there is a discrepancy between the two measurements measurement of the glomerular filtration rate should be repeated at regular intervals. The dose of cyclosporin should be reduced if an increase in serum creatinine concentration or a decrease in glomerular filtration rate of more than 30% from the patient's own baseline values is confirmed on two occasions within two weeks, even if the new values are still within the laboratory's normal range. Similarly, if the diastolic blood pressure exceeds 95 mm Hg the dose should be reduced or hypertension treated by conventional means, but diuretics and β blockers should be avoided. If the deterioration in renal function or hypertension does not respond to dose reduction cyclosporin should be stopped. Insufficient response to psoriasis after six weeks of treatment at 5 mg/kg body weight a day should also result in stopping cyclosporin. Because of the lack of available data on safety treatment should not be continued for longer than one year without careful reassessment and continued close monitoring.

Drugs interactions—The following drugs may interact with cyclosporin and therefore should be avoided: aminoglycosides, amphotericin B, trimethoprim, ketoconazole, phenytoin, rifampicin, isoniazid, and non-steroidal anti-inflammatory drugs. Patients receiving cyclosporin and their family doctors must be given written instructions indicating the potential dangers of the concomitant administration of these drugs.

Hydroxyurea

Experience with hydroxyurea in the treatment of psoriasis is limited. In two clinical studies, however, about 60% of patients, even of those with pustular or erythrodermic psoriasis, achieved a 60% improvement.[21,22] Its main side effects are bone marrow toxicity and teratogenicity (it is advisable to allow six months to elapse after stopping treatment with hydroxyurea before embarking on pregnancy). Macrocytosis can occur in the absence of anaemia.

Dosage regimens—The initial dose of 1 g/day should be maintained for four weeks. If an inadequate clinical response is seen and side effects permit the dose may be increased to a maximum of 1·25-1·50 g/day. If an adequate clinical response is achieved the dose should be titrated down according to clinical response and bone marrow toxicity.

AZATHIOPRINE

Very little information is available on the use of azathioprine in psoriasis, but in the available studies a response rate of about 60% was achieved.[23] Its main side effects are bone marrow toxicity (the risk is less than with methotrexate or hydroxyurea), teratogenicity, and oligospermia, and its long term use in patients with other conditions is associated with at least a 30-fold increase in relative risk of lymphoreticular cancers. Although azathioprine itself is cleared from the body within seven days, pregnancy should not be embarked on within six months after stopping treatment because of the drug's continuing effects on the immune system. It is given in doses of 2·0-2·5 mg/kg body weight a day and is known to interact with allopurinol, penicillamine, and non-depolarising muscle relaxants.

SYSTEMIC CORTICOSTEROIDS

Stopping treatment with systemic corticosteroids may precipitate erythrodermic psoriasis, generalised pustular psoriasis, or very unstable psoriasis. Systemic corticosteroids should therefore be used only for the following three rare and specific conditions[24]: persistent, otherwise uncontrollable, erythroderma causing metabolic complications; generalised pustular psoriasis of the von Zumbusch type if other drugs are contraindicated or ineffective (this includes impetigo herpetiformis—a form of pustular psoriasis that occurs in pregnancy); and hyperacute psoriatic polyarthritis that threatens severe irreversible joint damage.

In all circumstances the use of systemic steroids should be considered as a short term measure used to allow time for other, slower acting systemic treatments such as methotrexate, started at the same time, to take effect.

Members of the workshop were as follows: R E A Williams; R M MacKie (University of Glasgow); A Hopkins (Research Unit, Royal College of Physicians of London); H Baker (former president, BAD); D Burrows (president, BAD); B R Allen (Nottingham); S S Bleehen (University of Sheffield); S M Burge (Oxford); N H Cox (Carlisle); R P R Dawber (Oxford); V R Doherty (Glasgow); W S Douglas (Airdrie); J Ferguson (Dundee); P S Friedmann (University of Liverpool); L Fry (London); J A A Hunter, S E Kelly (University of Edinburgh); J M Marks (University of Newcastle); J R Marsden (Birmingham); S C F Rogers (Dublin); N B Simpson (Glasgow); D M Tillman (University of Glasgow); M J Young (Paisley).

Use of guidelines to derive audit measures

Diagnosis, assessment, and initial management

(1) Is the diagnosis in clinical doubt? Yes/No
(2) Is the patient receiving any treatment likely to precipitate or aggravate psoriasis? Yes (What)/No
(3) What in the patient's view is the most distressing or disabling aspect of the psoriasis?
(4) Has the nature of psoriasis been explained to the patient? Yes/No
(5) Have the treatment options been discussed in the light of (4)? Yes/No
(6) Has the patient had an adequately documented 8-12 week trial of topical treatment? Yes/No
(7) If topical steroids are included in the regimen is the potency and quantity used appropriate? Yes/No
(8) Is referral to a consultant dermatologist appropriate? Yes/No

Phototherapy

(9) Has the minimal erythema dose been estimated? Yes/No
(10) Is the patient receiving an appropriate treatment regimen? Yes/No

Systemic treatment

(11) Are the indications to move to systemic treatment appropriate? Yes/No
(12) Have the options and side effects of possible regimens been fully discussed with the patient? Yes/No
(13) If appropriate, has the need for contraception been fully discussed and appropriate provision arranged if required? Yes/No
(14) Has the patient been given a psoriasis systemic treatment card? Yes/No
(15) If yes, does the patient show this card to the general practitioner when receiving prescriptions for unrelated problems? Yes/No

Photochemotherapy (PUVA)

(16) Has the patient been given advice about appropriate eye protection? Yes/No
(17) Have men been given advice about screening genitalia during PUVA? Yes/No
(18) Has the minimal phototoxic dose been estimated? Yes/No
(19) Is there a clear record of individual treatments and cumulative ultraviolet A dosage? Yes/No
(20) Is the patient receiving an appropriate review and follow up programme? Yes/No

Methotrexate

(21) Have pretreatment investigations excluded haematological, biochemical, and hepatic contraindications? Yes/No
(22) Is the patient taking any drug known to have an adverse interaction with methotrexate? Yes/No
(23) Are the arrangements for regular review and haematological and biochemical monitoring appropriate? Yes/No

Etretinate

(24) For women has the need for prolonged contraception (two years) after withdrawal of drug been fully discussed? Yes/No
(25) Is the dosage regimen appropriate? Yes/No
(26) Are review arrangements adequate? Yes/No

Cyclosporin

(27) Has the serum creatinine concentration been measured? Yes/No
(28) Have potential drug interactions been considered? Yes/No
(29) Is the current dose of cyclosporin appropriate? Yes/No

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